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## Painful Foot with Talo-Calcaneal Coalition

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Tarsal coalition has been recognized for many years, having first been described by BUFFON in 1750. However until HARRIS and BEATH (1948) demonstrated medial talocalcaneal bridge with peroneal spastic foot, the anatomical abnormality had not associated with certain clinical situations.

Although it is now accepted that tarsal coalition is commonly associated with peroneal spastic flat foot, this abnormalities are not common and may be prone to be overlooked when the union is incomplete and give no roentgenographic evidence of bony union.

In this report, we described a case of incomplete talocalcaneal coalition that showed coexistence of synchondrosis and syndesmosis between talus and sustentaculum talare calcanei. It should be emphasized that, when adolescent person complains of pain in the foot particularly with the varus movement of the hind part of the foot, the presence of such an abnormality should be taken into consideration.

### Case Report

The patient was a thirteen year old girl who was referred to Kyoto University Hospital in February 1976 with a two-year history of increasing pain in the right foot, particularly on weight-bearing and varus motion of the hind part of the foot. She could walk with a limp for only ten minutes without a rest. On examination, she had flat foot on right side and invasion was restricted, but typical peroneal spasm was not observed at that time. There was localized tenderness over the medial aspect of her foot in the region of the talo-calcaneal joint.

Radiographes of the foot showed narrowing and blurring of the subtalar joint space. The bony union between talus and calcaneus was not observed radiologically (Fig. 1). Osteoarthritic change of the talo-calcaneal joint was suspected at that time. Colloidal steroid was injected intraarticular that offered relief of pain for only a few days. Treatment with medial longitudinal arch support also did not offer relief. Bone scintigraphy with  $^{99m}\text{Tc}$ -EHDP revealed marked up-take of radioisotopes around the posterior part of the talo-calcaneal joint as shown in Fig. 2.

An operation was performed after unsuccessful conservative treatment for six months. Through a medial approach, the subtalar joint was explored. Apparently the joint between



**Fig. 1.** Radiograph of the foot showed some blurring of the subtalar joint space, and ossearthritic change of the joint was suspected initially.

sustentaculum talare and neck of talus was not seen and talus and calcaneus seemed to form a bony block. However, a portion of the bone which might correspond to the subtalar joint was easily pierced with a needle. A bone including the part of synchondrosis was removed in a lump and sinus tarsi was enlarged (Fig. 3). Fusion of the talus and calcaneus was accomplished by fitting an iliac bone graft into the space. After operation, a short leg cast was applied for five weeks, then weight bearing with foot arch support was begun. She has not complained of pain on the posterior part of the foot after the arthrodesis.

The biopsy material revealed both synchondrosis and syndesmosis between talus and calcaneus. The cartilaginous tissue showed the characteristic appearance of hyaline cartilage, that was, subchondral bone, calcified layer, tide mark, and uncalcified zone were clearly diffe-



**Fig. 2.** The high up-take of bone seeking isotope surround the talo-calcaneal joint was observed.

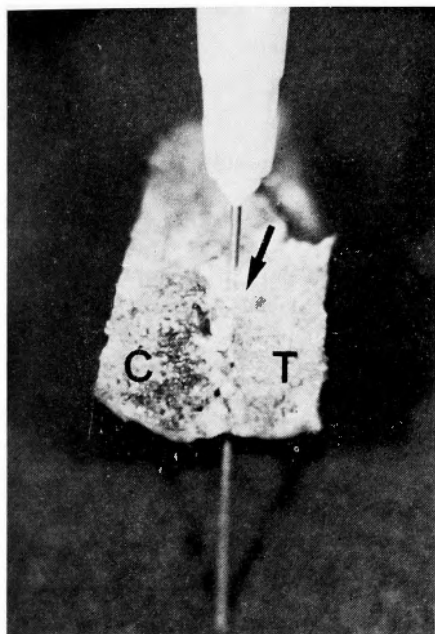


Fig. 3. A bone including the part of synchondrosis was removed in a lump. Particular portion of the bone was easily pierced with a needle which might correspond to the subtalar joint. (C : calcaneus, T : talus, Arrow : cartilaginous tissue.)

renciated. But the uncalcified zone of two cartilage tissues which came from talus and calcaneus were united with each other and superficial zone was absent (Fig. 4).

### Comment

Talo-calcaneal coalition seems to be rare congenital anomaly and may be overlooked if the presence of such a abnormality is not suspected in preadolescence with a persistent foot pain. It is not clear why the foot pain comes from the cartilaginous union between talus and calcaneus. By bone scintigraphy, it was revealed that the bone around the talo-calcaneal joint showed the high up-take of bone seeking isotope. This fact suggested that the bone around the syndesmosis was stressed by movement of the foot as in pseudarthrosis after fracture.

Arthrodesis of the subtalar joint was undertaken and from the histological findings it was obvious that restoration of the joint movement by removing the talocalcaneal coalition was im-

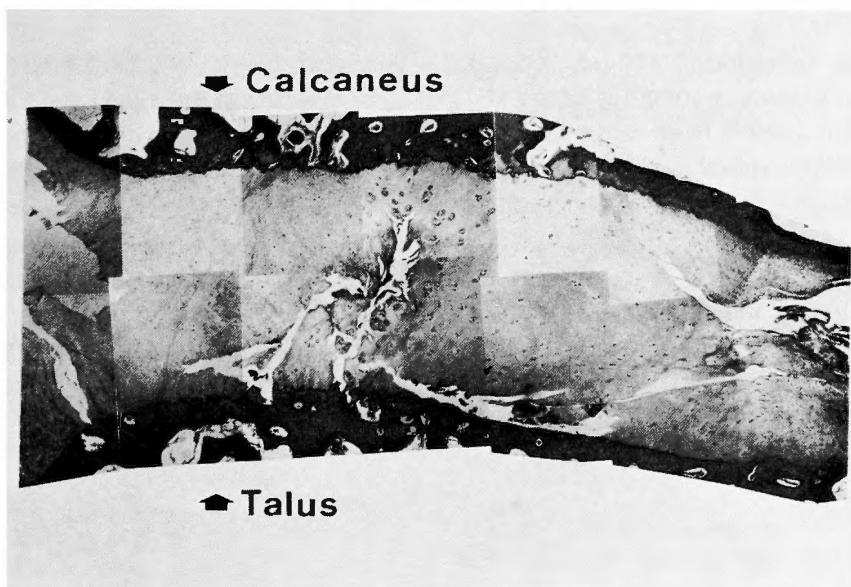


Fig. 4. The cartilaginous tissue between talus and calcaneus shows the characteristic appearance of hyaline cartilage, but syndesmosis is also seen on the right side of the figure.

possible. The normal talonavicular joint was left without fusion. If the talonavicular joint will develop arthritic changes in future, arthrodesis would be needed.

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### 和文抄録

## 距踵骨癒合症に原因する足関節痛の症例

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距踵骨癒合症 (talo-calcaneal coalition) の存在は以前より知られていたが、それが臨床的な意味を持つことが判ったのは、1948年 Harris 等の報告による。彼等は、この異常が peroneal spastic flat foot の原因となることを明らかにし、しかし、レ線上に距踵骨癒合が判別しにくいこともあって、この疾患の報告は非常に稀である。

我々は13才女で数年来の足関節痛があり、最近では10分程度の歩行しか出来なかった incomplete talo-calcaneal coalition の例を報告した。レ線上是距踵関節は辺縁不整で狭小化がみられたが、骨癒合は認めなかった。手術所見では距踵骨の内側面は連続した平面

となっており、一見したところ骨癒合を生じている如くであったが、距踵関節とおぼしき部を刺入すると容易に刺入され軟骨結合であることが認められた。その部を en bloc に摘出し腸骨移植にて関節固定を行った。組織所見では軟骨部は距骨及び踵骨の定型的な関節軟骨がその表層部を共有した形であり、又、一部には線維軟骨性の結合もみられた。関節固定施行後は足関節の疼痛は消失している。

青少年期において外反扁平足を伴う足関節痛を訴えた場合にこの疾患を考慮に入れる必要があることを強調した。